



**MAIL STOP APPEAL
BRIEF - PATENTS**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: B. Herman Attorney Docket No. WEYE121980/24877
Application No.: 10/727,442 Group Art Unit: 3643
Filed: December 3, 2003 Examiner: J.L. Gellner
Title: USE OF A CYTOKININ TO PROMOTE GROWTH OF SHOOTS FROM A
LOG

TRANSMITTAL OF APPEAL BRIEF

November 9, 2005

TO THE COMMISSIONER FOR PATENTS:

Enclosed herewith for filing in the above-identified application is an Appeal Brief. The Commissioner is hereby authorized to charge the Appeal Brief fee of \$500, as well as any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.18 which may be required during the entire pendency of the application, or credit any overpayment, to Deposit Account No. 23-1480. This authorization also hereby includes a request for any extensions of time of the appropriate length required upon the filing of any reply during the entire prosecution of this application. A copy of this sheet is enclosed.

Respectfully submitted,

WEYERHAEUSER COMPANY

Teresa J. Wiant
Registration No. 36,967
Direct Dial No. 253.924.3991

I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

Date:

11/10/05

Susan J. Finn



AF/IFW
MAIL STOP APPEAL
BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Application No: 10/727,442 Group Art Unit: 3643
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Title: USE OF A CYTOKININ TO PROMOTE GROWTH OF SHOOTS FROM A LOG

APPELLANT'S APPEAL BRIEF

November 9, 2005

TO THE COMMISSIONER FOR PATENTS:

This brief is in support of a Notice of Appeal filed in the above-identified application on August 10, 2005, to the Board of Patent Appeals and Interferences appealing the decision dated May 17, 2005. A Pre-Appeal Brief conference was held in connection with this matter, and a Notice of Panel Decision from Pre-Appeal Brief Review was mailed on October 19, 2005, indicating the Panel's decision that the application remains under appeal because there is at least one actual issue for appeal.

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I. REAL PARTY IN INTEREST

Weyerhaeuser Company, a Washington corporation, having a place of business at 33663 Weyerhaeuser Way South, Federal Way, Washington, is the assignee of the entire interest of the appealed subject matter.

II. RELATED APPEALS AND INTERFERENCES

There are no known related appeals, interferences or judicial proceedings.

III. STATUS OF CLAIMS

Claims 1-14 are pending in the application. All claims stand rejected under 35 U.S.C. § 103(a). The Applicant now appeals the rejection of Claims 1-14. The table below indicates their status.

| Claim(s) | Status | Appealed |
|----------|----------|----------|
| 1 | Original | Yes |
| 2 | Original | Yes |
| 3 | Original | Yes |
| 4 | Original | Yes |
| 5 | Original | Yes |
| 6 | Original | Yes |
| 7 | Original | Yes |
| 8 | Original | Yes |
| 9 | Original | Yes |
| 10 | Original | Yes |
| 11 | Original | Yes |
| 12 | Original | Yes |
| 13 | Original | Yes |
| 14 | Original | Yes |

IV. STATUS OF AMENDMENTS

The application was finally rejected in a paper dated May 17, 2005. No claim amendments have been entered. A copy of the appealed claims as originally filed is attached in the Claims Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

There is one independent claim on appeal, Claim 1. Claim 1 is directed to a method for promoting the growth of shoots from a log. The method includes the step of applying at least one cytokinin to a member of the group consisting of an Alder log, a Beech log and a Birch log, in an amount sufficient to promote the growth of shoots from the log. Logs are described in the specification as typically between twelve inches and twenty-four inches long, with a diameter typically between one inch and two inches. (Specification, page 3, lines 9-11.) The term "shoot" is defined in the specification as tissue that grows from any portion of an Alder, Beech or Birch log (e.g., a bud or lenticel) that has meristematic activity. (Specification at page 8, line 22.) The shoots may have the appearance of small branches and may form leaves. The shoots can be induced to form roots by cutting the shoots from the log, applying a rooting hormone to the cut surface of the shoot, and cultivating the shoot in a growth medium under conditions that promote root formation. (Specification at page 8, line 25 to page 9, line 20.)

Claims 2-14 depend from Claim 1. Claim 2 recites the application of the cytokinin to the log as an aqueous solution. Claim 3 recites the application of the aqueous solution as a mist. Claims 4-6 recite continuous application, intermittent application and once a week application of the cytokinin to the log, respectively. Claim 7 recites that the cytokinin is selected from the group consisting of benzylaminopurine, 6-furfurfurylaminopurine, 6-(4-Hydroxy-3-methylbut-2-enylamino)purine, and 6-(γ , γ -Dimethylallylamino)purine. Claim 8 specifies that the cytokinin consists essentially of benzylaminopurine. Claims 9-11 recite specific concentration ranges of the cytokinin. Claim 12 specifies that the cytokinin consists essentially of 6-(γ , γ -Dimethylallylamino)purine. Claim 13 is specific to benzylaminopurine in an aqueous solution. Claim 14 recites that the method of Claim 1 further comprises applying a fertilizer that includes

no more than about 0.01% (w/v) nitrogen to the log in an amount sufficient to promote the growth of shoots from the log.

By way of background, there is a demand for Alder, Beech and Birch trees that possess desirable characteristics, such as an accelerated growth rate, or desirable wood characteristics. (Specification, page 1, lines 9-11.) One approach to propagating Alder, Beech and Birch trees that possess desirable characteristics is to clone these trees. The present invention provides methods that promote the growth of shoots from a log obtained from a parent Alder, Beech or Birch tree. (Specification, page 1, lines 16-21.) As a result of practicing the method of the present invention, numerous shoots can be propagated from a single parent Alder, Beech or Birch tree. These shoots can then be cultivated to produce Alder, Beech or Birch trees that are genetically identical to the parent tree. (Specification, page 1, lines 16-19.)

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

First Ground of Rejection - Claims 1, 7 and 8

Claims 1, 7 and 8 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al., *Plant Cell, Tissue and Organ Culture* 60:213-220 (2000), in view of Saul et al., *Forest Research Note 33*, Ministry of Natural Resources, Ontario, Canada, 1982.

Second Ground of Rejection - Claims 2-6, 9, 10 and 13

Claims 2-6, 9, 10 and 13 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al. in view of Saul et al., and further in view of Bryan et al., *HortScience* 26(4):389-390, 1991.

Third Ground of Rejection - Claims 11 and 12

Claims 11 and 12 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al. in view of Saul et al., and further in view of Bryan et al. and further in view of applicant's Specification.

Fourth Ground of Rejection - Claim 14

Claim 14 stands rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al., in view of Saul et al., and further in view of Wang, *HortScience* 25(12):1602-1604, 1990.

VII. ARGUMENT

First Ground of Rejection - Claims 1, 7 and 8

Claims 1, 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cuenca et al., *Plant Cell, Tissue and Organ Culture* 60:213-220 (2000) in view of Saul et al., *Forest Research Note 33*, Ministry of Natural Resources, Ontario, Canada, 1982. Applicant respectfully disagrees with the Examiner's conclusions for the following reasons.

As an initial matter, applicant wishes to point out that the claimed invention is a method of promoting shoots from a log, comprising the step of applying at least one cytokinin to a member of the group consisting of an Alder log, a Beech log, and a Birch log, in an amount sufficient to promote the growth of shoots from the log, as required by Claim 1, from which Claims 2-14 depend. Applicant submits that none of the cited references, either alone or in combination, teaches or suggests a method of promoting shoots from a log, as claimed.

The Examiner sets forth the position that Cuenca et al. teaches an *in vitro* method for promoting growth of shoots by applying a cytokinin to *Fagus* shoots. Saul et al., is cited as teaching the use of a log (referred to as "cuttings" in Saul), as a source for propagation. The Examiner acknowledges that Cuenca et al. does not disclose the growth of shoots from a log. However the Examiner takes the view that it would have nevertheless been obvious to one of ordinary skill in the art at the time of the invention to modify the *in vitro* method of regenerating adventitious buds taught by Cuenca et al. by using a log as disclosed by Saul et al. so as to have a practical way of propagating cuttings of alder with both shoots and roots to increase the developmental speed of improved genotypes (Office Action dated September 14, 2004, page 2). Applicant respectfully disagrees with the Examiner's conclusions.

Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the referenced teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); Manual of Patent Examining Procedure (M.P.E.P.) (8th Ed. Aug. 2001, rev. May 2004) Sections 706.02(j), 2142 and 2143. As stated in *In re Fritch*, 972, F.2d 1260, 1266, 23 USPQ2d 1780, 1784, (Fed. Cir. 1992), it is impermissible to use the claimed invention as an instruction manual or "template" in attempting to piece together isolated disclosures of the prior art so that the claimed invention is rendered obvious.

The Federal Circuit has consistently held that a person of ordinary skill in the art must not only have had some motivation to combine the prior art teachings, but some motivation to combine the prior art teachings in the particular manner claimed. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed."). Moreover, "[a] prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed Cir 1983), *cert. denied*, 469 U.S. 851 (1984). Evidence that it would have been obvious to try a given invention is insufficient to support a finding of obviousness. *In re O'Farrell*, 853, F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988) ("An obvious-to-try situation exists when a general disclosure may pique the scientists' curiosity, such that further

investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result.")

For the reasons set forth in detail below, applicant respectfully submits that the burden of establishing a *prima facie* case of obviousness has not been met because there is no suggestion to combine or modify the references' teachings to arrive at the claimed invention. In addition, because the cited references teach away from the claimed invention, there can be no reasonable expectation of success for their combined teachings.

The Examiner cites Cuenca et al. as teaching a method for promoting growth of shoots by applying a cytokinin to *Fagus* shoots. As noted by the Examiner, Cuenca et al. does not teach or suggest the method of promoting growth of shoots from logs as recited in Claim 1. The Examiner takes the position, however, that it would have been obvious to modify the method of Cuenca et al by using a log as disclosed in Saul et al so as to have a practical way of propagating cuttings of Alder with both shoots and roots so as to increase the developmental speed of improved genotypes.

Cuenca et al. discloses an *in vitro* method of regenerating adventitious buds from internode segments of Beech shoots. The *in vitro* shoot cultures used in the Cuenca study were all of juvenile origin, and were established from shoot-tips and axillary buds of two-month-old seedlings, and a four-year-old plant. (Cuenca, page 214, column 2.) The shoot cultures were maintained *in vitro* in 500 ml glass jars containing 800ml of a shoot proliferation medium and subcultured every six weeks. (Cuenca, page 214 Column 1-2.) To promote the formation of adventitious buds, internodal segments of the *in vitro* shoot cultures were excised from the donor shoot and divided into 2 to 3 millimeter-long segments which were placed into Petri dishes containing 25 ml of bud induction medium. Callus formed on the internodal segments, and adventitious shoot-buds formed on the callus. The reference states that "[C]allus formation

appears to be an essential step in the regeneration of adventitious buds in *Fagus*." (Page 215, column 2.) The study concluded that "[t]he regeneration rates [of adventitious buds] achieved by internode explants were similar or higher to those found in leaf sections (citations omitted). Leaf sections exhibited a higher incidence of browning and necrosis, which reduced the efficiency of the regenerative system based on leaf explants." (Cuenca et al., page 220, first column.) Thus, Cuenca et al. teaches that the ability of different parts of a Beech plant (e.g. stem internode sections versus leaves) are not equally amenable to the production of adventitious buds in an *in vitro* system.

Applicant submits that Cuenca et al. provides no suggestion or motivation to modify the disclosed *in vitro* method for use with logs, as required by Claim 1. There is no suggestion or teaching in cited references that the method of Cuenca et al. would produce adventitious buds, then shoots from a log. Rather, the Cuenca reference discloses that it was known in the art that previous attempts to induce bud regeneration from explanted plant material from beech were unsuccessful (Cuenca, page 214, column 1). The Examiner relies on the statement in the Cuenca reference that "[s]hoot cultures of juvenile origin were used as an intermediary step in obtaining bud regeneration from adult material in the field." (Final Office Action mailed May 17, 2005). As noted by the Examiner, "the cutting from older planter material may be physiologically different from internodal segments of shoots that have been continuously cultured on a growth medium *in vitro*," however, the Examiner nevertheless concludes "since the goal of Cuenca et al. is to use adult material, one of ordinary skill in the art would have found it obvious to alter the method of Cuenca to use logs." (See Final Office Action, dated May 17, 2005). Applicant submits that the eventual goal stated in Cuenca of obtaining bud regeneration from adult material in the field, does not provide a motivation or expectation of success to modify the disclosed *in vitro* method for use with logs. Rather, Applicant submits that because the Cuenca reference

teaches away from the claimed invention, there is no reasonable expectation of success for the application of the *in vitro* method to propagation of identical adult plants from logs. As stated in the Cuenca reference, "[A]lthough adventitious shoot production is generally undesirable for clonal micropropagation, because it can result in somaclonal variation, it presents an opportunity to regenerate plants from genetically transformed clones" (page 213, second column). Therefore, based upon this disclosure, there not only is no motivation to modify the *in vitro* method of Cuenca for use with logs, there is teaching away from such a combination. A prior art reference must be considered in its entirety, including portions that would lead away from the claimed invention. MPEP § 2141.02.

Moreover, applicant submits that Cuenca et al. provides no guidance with respect to the use of adult material, and, indeed, teaches that different types of Beech (e.g., stem internode sections versus leaves) respond differently to tissue culture (see Cuenca et al., page 220, first column).

The deficiencies of the teachings of Cuenca are not cured by the teachings of Saul, or any one or more of the other references cited by the Examiner, as further described below. The Examiner cites Saul et al. as teaching the use of a log ("cuttings" of Saul) as a source for propagation. (Office Action dated May 17, 2005). Saul et al. discloses the vegetative propagation of Alder by use of rooted cuttings (see, e.g., Saul pages 1-2). Saul et al. used 10-16 cm long cuttings (referred to as "logs" by the Examiner) collected from 20-25 year-old Alder trees that were dipped into a rooting hormone powder and planted vertically into a rooting medium (Saul, page 1). The study described in Saul examined the conditions for the best rooting, and determined that the cuttings rooted in all mixtures tested, and that the majority of the roots developed from the callus at the bottom of the cuttings (Saul, page 2). Saul does not teach or suggest a method of promoting the growth of shoots from a log comprising the step of

applying at least one cytokinin to the log, as claimed in Claim 1. Moreover, there is no suggestion or motivation in the Saul reference to combine the use of a log with the teachings of Cuenca. As noted by the Examiner, the cuttings from 20-25 year-old trees as used by Saul et al. are physiologically different from internodal segments of shoots that have been continuously cultured on growth medium *in vitro*, as used by Cuenca. Consequently, there is no expectation of success inferred from either reference that would lead one to believe the method of Cuenca et al. would produce adventitious buds, then shoots from the cuttings used by Saul et al.

Moreover, applicant submits that it would be impractical to culture 10-16 cm long cuttings on medium *in vitro*. For example, a large and cumbersome container would be required to culture the 10-16 cm long cuttings.

In summary, applicant respectfully submits that neither Cuenca nor Saul teaches, suggests, or provides any motivation to make or otherwise render obvious the claimed invention. Accordingly, applicant submits that the combination of the two references is improper, and the obviousness rejection of Claim 1 should be reversed. Because applicant submits that Claim 1 is allowable, the dependent Claims 2-14 are allowable at least because they are dependent upon an allowable claim.

Second Ground of Rejection - Claims 2-6, 9, 10 and 13

Claims 2-6, 9, 10 and 13 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al. in view of Saul et al., and further in view of Bryan et al., *HortScience* 26(4):389-390, 1991. Applicant respectfully disagrees.

The Examiner cites Bryan et al. as disclosing the intermittent application of a cytokinin as an aqueous mist in a woody species. Applicant submits that Bryan et al. merely discloses the foliar application of a cytokinin on Fraser fir seedlings and does not cure the deficiencies of the teachings of Cuenca or Saul. For the reasons set forth above in connection with the rejection of

Claims 1, 7 and 8 as being unpatentable over Cuenca et al. in view of Saul et al., applicant submits that Claims 2-6, 9, 10 and 13 are not unpatentable over Cuenca et al. in view of Saul et al. and further in view of Bryan et al. Accordingly, applicant respectfully requests reversal of this ground of rejection.

Third Ground of Rejection - Claims 11 and 12

Claims 11 and 12 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al. in view of Saul et al., and further in view of Bryan et al. and further in view of applicant's Specification.

For the reasons stated above in connection with the rejection of Claims 1, 7 and 8 as being unpatentable over Cuenca et al. in view of Saul et al., applicant submits that Claims 11 and 12 are not unpatentable over Cuenca et al. in view of Saul et al., and further in view of Bryan et al. and further in view of applicant's specification. Accordingly, applicant respectfully requests reversal of this ground of rejection.

Fourth Ground of Rejection - Claim 14

Claim 14 stands rejected as being unpatentable under 35 U.S.C. § 103(a) over Cuenca et al. in view of Saul et al. and further in view of Wang et al., Wang, *HortScience* 25(12):1602-1604, 1990. Applicant respectfully disagrees for the following reasons.

As an initial matter, Applicant submits that Claim 14 is separately patentable from Claims 1-13 because it is directed to a different concept that is also not shown or made obvious in view of the prior art. Specifically, Claim 14 is directed to the method of Claim 1, further comprising applying a fertilizer, that includes no more than about 0.01% (w/v) nitrogen, to the log in an amount sufficient to promote the growth of shoots from the log.

The Examiner acknowledges that the teachings of Cuenca and Saul are silent with respect to the application of nitrogen ("N") fertilizer at no more than 0.01% (w/v) nitrogen to a log. The Examiner cites Wang et al. as teaching the use of N fertilizer with foliar applications of benzylaminopurine ("BA"). (Office Action mailed May 15, 2005, page 5.) The Examiner takes the view that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Cuenca et al. as modified by Saul et al., by adding the N fertilizer to the method as disclosed by Wang et al. so as to accelerate growth rates, and to use 0.01% nitrogen sources so as to optimize the method. Applicant disagrees for the following reasons.

As stated in the instant application, "the present inventors have observed that fertilizers that include substantial amounts of nitrogen are detrimental to the growth of shoots on Alder, Beech or Birch logs. Consequently, Alder, Beech or Birch logs are nourished with a fertilizer that includes no more than about 0.01% (w/v) nitrogen. Some fertilizers useful in the practice of the present invention do not include any nitrogen." (See Spec. at page 4, line 31 to page 5, line 3.)

In contrast to the claimed invention, Wang et al. discloses that a 24N-3.5P-13.3K water-soluble fertilizer applied at a rate of 0.42 g/500ml weekly produced the best plants and resulted in the best cutting growth (abstract). Therefore, the cited reference teaches away from the claimed invention because it teaches that the use of N fertilizer improves the growth of cuttings, in contrast to the claimed invention which recites the use of fertilizer with very low levels or no nitrogen. Accordingly, for the reasons set forth in connection with the rejection of Claims 1, 7 and 8 as being unpatentable over Cuenca et al. in view of Saul et al., and further in view of the fact that Wang et al. teaches away from the claimed invention, applicant submits that Claim 14 is

patentable in view of the cited references either alone, or in combination. Accordingly, applicant respectfully requests reversal of this ground of rejection.

Respectfully submitted,

WEYERHAEUSER COMPANY

A handwritten signature in black ink, appearing to read 'T. J. Wiant', with a long horizontal flourish extending to the right.

Teresa J. Wiant

Registration No. 36,967

Direct Dial No. 253.924.3991

VIII. CLAIMS APPENDIX

1. A method for promoting the growth of shoots from a log, the method comprising the step of applying at least one cytokinin to a member of the group consisting of an Alder log, a Beech log and a Birch log, in an amount sufficient to promote the growth of shoots from the log.
2. The method of Claim 1 wherein the cytokinin is applied to the log as an aqueous solution.
3. The method of Claim 2 wherein the aqueous solution is applied to the log as a mist.
4. The method of Claim 1 wherein the cytokinin is continuously applied to the log.
5. The method of Claim 1 wherein the cytokinin is intermittently applied to the log.
6. The method of Claim 1 wherein the cytokinin is applied to the log at least once per week on each week of a series of successive weeks.
7. The method of Claim 1 wherein the cytokinin is selected from the group consisting of benzylaminopurine, 6-furylfuryleaminopurine, 6-(4-Hydroxy-3-methylbut-2-enylamino)purine, and 6-(γ,γ -Dimethylallylamino)purine.
8. The method of Claim 1 wherein the cytokinin consists essentially of benzylaminopurine.
9. The method of Claim 2, wherein the concentration of the cytokinin in the aqueous solution is from about 5 mg/L to about 100 mg/L.
10. The method of Claim 9 wherein the cytokinin is selected from the group consisting of benzylaminopurine, 6-furylfuryleaminopurine, and 6-(4-Hydroxy-3-methylbut-2-enylamino)purine.

11. The method of Claim 2, wherein the concentration of the cytokinin in the aqueous solution is from about 0.5 mg/L to about 10 mg/L.

12. The method of Claim 11 wherein the cytokinin consists essentially of 6-(γ,γ -Dimethylallylamino)purine.

13. The method of Claim 1 wherein the cytokinin is benzylaminopurine present in an aqueous solution at a concentration in the range of from about 5 mg/L to about 100 mg/L, and the benzylaminopurine is applied to the log as a mist from once to three times per week for at least three weeks.

14. The method of Claim 1 further comprising applying a fertilizer, that includes no more than about 0.01% (w/v) nitrogen, to the log in an amount sufficient to promote the growth of shoots from the log.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.